REMARKS/ARGUMENTS

Favorable reconsideration of this application is respectfully requested.

Claims 1-39 are present in this application. Claims 1-14, 19 and 39 are rejected under 35 U.S.C. § 102(b) over U.S. 5,710,620 (Taniguchi), and claims 15-18 are rejected under 35 U.S.C. § 103(a) over Taniguchi in view of what is termed the Applicants' Admitted Prior Art (AAPA). Claims 20-38 stand withdrawn as directed to a non-elected invention.

First, it is noted in the Office Action on page 3 that the language in claim 1 "the phase modulation element has a phase distribution based on a phase modulation unit which is optically smaller than a radius of a point spread distribution range of the image forming optical system when converted to an image formation surface to the image formation optical system" was found indefinite. However, there is no § 112, second paragraph, rejection and paragraph 1 of the Office Action notes that the § 112, second paragraph, rejection was fully considered and withdrawn based upon the prior response. Thus, it is not clear why the Office Action states that the above-quoted language is indefinite.

In any event, this language refers to the size of a phase modulation unit relative to the radius of a point spread distribution range of the image formation optical system, and describes a situation where the point spread distribution is converted by the imaging system to the image surface compared with the phase modulation element. The phase modulation unit is optically smaller, which is shown in, for example, Figures 3 and 4 of the present application where a unit of the phase modulation element 1 is smaller than the distribution having a radius R (Figure 3B). The radius R of the point spread distribution is found on the image surface 3f of the process substrate 4 as described on page 23 of the application. Referring to Figure 3C, the complex amplitude distribution in a circle having a diameter R' is optically converted to the point spread distribution R at the image surface of the image formation optical system. Thus, it is respectfully submitted that claim 1 is sufficiently clear

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for one skilled in the art to make and use the invention, and to understand that the structure of

the apparatus of claim 1 is different from that disclosed in Taniguchi, for the reasons

discussed below.

As was explained in the prior response, claim 1 is directed to a crystallization

apparatus having a phase modulation element including at least two phase modulation units

and is configured to transmit light having a phase distribution based upon a phase pattern of

the at least two phase modulation units. Each of the at least two phase modulation units is

optically smaller than a radius of a point spread distribution range of the image formation

optical system when converted to an image formation surface of the image formation optical

system, and the radius of the point spread distribution range of the image formation optical

system is defined to satisfy $R/2=0.61\lambda/NA$, where $R/2$ indicates the radius of the point spread

distribution range of the image formation optical system, λ indicates a wavelength of the light

beams and NA indicates an image side numerical aperture of the image forming optical

system. Here, the radius of the point spread distribution is dependent upon the numerical

aperture of the image forming optical system. The numerical aperture, which depends on the

refractive index and the angle of light entering a lens, is clearly a structural element of the

optical system, resulting in that the point spread distribution range is based upon the

structural elements of the claimed apparatus, and is not an "intended use" of the apparatus,

contrary to the assertions made in the Office Action.

In order to more clearly understand this feature of the claimed apparatus, Applicants

have provided an article in which the first two named authors are inventors in the present

application, along with a reference drawing. The article describes schematic views showing

the range of the point spread distribution defined by the above equation under the same

conditions shown in Figures 2A,2D and 2C,2F in Taniguchi. See Fig. 4(c) of the article and

the discussion in the left-hand column of page G68. In more detail, the above equation

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indicates that the area of the point spread distribution (point spread function) falls within a range in which only zero-order light (non-diffracted light) is located. Zero-order light reaches the image plane while higher-order diffracted light escapes outside the pupil. The image takes on a uniform light intensity.

In contrast, in Taniguchi the system causes first order light (primary diffracted light Dma and Dpa) to fall within the range of the embodiment of Figures 2A,2D and 2C,2F referenced by the Office Action, illustrated by the circles within pupil plane Ep. In the reference drawing only the zero-order light falls within Ep. Accordingly, as Taniguchi does not disclose or suggest an apparatus having the structural parameters providing the claimed point distribution range based upon the numerical aperture of the image forming optical system as recited in claim 1, the apparatus of claim 1 is clearly patentably distinguishable over Taniguchi. Withdrawal of the rejection of claim 1 based on Taniguchi is respectfully requested.

The § 103 rejection relies upon the AAPA to teach a phase shifter and light absorption distribution, as discussed on pages 5 and 6 of the Office Action. It is asserted that it would be obvious to modify Taniguchi to use the phase shifter taught in the AAPA. Even if such combination were possible, the AAPA fails to disclose or suggest the apparatus recited in claim 1 and thus the proposed combination of Taniguchi and AAPA would not disclose or suggest the apparatus of claim 1. Withdrawal of the § 103 rejection based upon Taniguchi and AAPA is respectfully requested.

Claim 39 also recites a phase modulation element including at least two phase modulation units and is configured to transmit a light having a phase distribution based upon a phase pattern of the at least two phase modulation units, and where the radius of the point spread distribution range of the image formation optical system is defined by the above-noted

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equation. Accordingly, claim 39 is patentable over <u>Taniguchi</u>, or <u>Taniguchi</u> considered with

AAPA, for the reasons discussed above.

It is respectfully submitted that the present application is in condition for allowance

and a favorable decision to that effect is respectfully requested.

Respectfully submitted,

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